



HOW THE INTERSTATE SYSTEM CAME TO BE

Tracing the Historical Process

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On June 29, 1956, President Dwight D. Eisenhower signed a bill authorizing the funding of the National System of Interstate and Defense Highways. This bill, however, was not the beginning of the Interstate Highway system. Eisenhower's signature culminated a process that began in the 1930s and that provoked contentious debates from the late 1940s onward over how to pay for highway construction in the United States.

The 1956 legislation was the product of choices made by many individuals and organizations over a span of almost 20 years. Those who were involved in selecting among the alternatives did not know how things would turn out. Tracing the historical process behind the Interstate Highway System is complicated but instructive.

Grounded in Federalism

Congress first provided funds for a national highway network in 1916, creating an administrative system grounded in federalism. This federal-aid highway program shared authority and funding with the states, resulting in the federal-state partnership that endures today.

The federal agency that has overseen this program—first as the Bureau of Public Roads (BPR) and now as the Federal Highway Administration—has enjoyed a reputation as the unrivaled source of technical expertise on every aspect of highway construction. Thomas H. MacDonald, BPR chief from 1919 to 1953, shared in and contributed to the agency's esteemed reputation.

MacDonald and BPR fostered the development of technical and administrative capacity at the state level. After 1921, these joint state and federal efforts focused on the nation's "seven percent system," the limited mileage of primary and secondary roads that each state selected for its share of federal aid. Primary roads comprised 3 percent of the nation's highways that linked cities and larger towns and formed the U.S.-numbered system.

Planning Methodology

Even as BPR and state highway departments worked to improve this basic rural road network, federal engineers began developing approaches to plan road construction. Their outlook, however, was narrow and limited—their primary concern was determining the economic value of better roads; gaining a sense of where the demand for road improvements was most acute was secondary.

Beginning in 1922 in Cleveland, Ohio, and Cook County, Illinois, engineers and economists slowly developed a planning methodology. Initially the planners emphasized the value of time saved and the benefits of undamaged freight shipments, but soon they were counting vehicles and urging the states to use origin–destination surveys to understand motorists' desires and travel behavior. By 1930, 11 western states had organized surveys at BPR's urging.

Highway planning efforts became more sophisticated during the 1930s and allowed BPR engineers to respond to alternative conceptions of the nation's highway system. The American fascination with cars continued despite the Depression, as attested by a



SOURCE: FHWA

Thomas H. MacDonald (*left*), Bureau of Public Roads (BPR) Chief from 1919 to 1953, has been called "the towering figure of road transportation in the 20th century." His deputy, H. S. Fairbank (*right*), headed up the BPR Division of Information and created the framework for statewide highway planning surveys.



Source: Dwight D. Eisenhower Library

PAST PRELUDE—The first Transcontinental Motor Convoy of 1919 consisted of 81 motorized Army vehicles that crossed the United States from east to west. The convoy set a world record pace, traveling 3,251 miles from Washington, D.C., to San Francisco in 62 days, only 5 days behind schedule. The average speed was 6 miles per hour, progressing an average of 58 miles per day. The convoy followed the Lincoln Highway, now U.S. 30, which included 1,800 miles of dirt roads, wheel paths, desert sands, and mountain trails. Lt. Col. Dwight D. Eisenhower participated in the convoy as a Tank Corps observer. “The old convoy...started me thinking about good, two-lane highways, but Germany...made me see the wisdom of broader ribbons across the land,” Eisenhower wrote in his 1967 memoir, *At Ease*.

steady increase in gasoline tax receipts, the only state-level revenue source that did not decline during the decade.

Envisioning a National System

Road projects dominated work-relief efforts. But some favored spending money on a different kind of road. The vision drew on the German autobahns, launched by Hitler in 1933 to employ workers and promote an automobile culture. The German roads captured attention in the United States, especially among highway engineers and road builders.

Several congressmen were attracted by the concept of a national system of advanced highways as a work-relief measure. Most of the plans—such as one advanced by Representative J. Buell Snyder of Pennsylvania in 1938—called for three east–west highways and five or six north–south roads to be paid for by bonds that would be retired by user tolls.

The goal was to put people to work, not to meet specific traffic needs. Several plans envisioned a national road authority that would undertake the construction.

Not surprisingly, most federal and state highway officials disliked these plans and their premises. To them, roads that failed to meet real traffic demands were wasteful. The next generation of BPR planning activities provided an enormous volume of data to support this argument.

Counting Traffic

MacDonald’s deputy, H. S. Fairbank, proposed systematic ways of collecting traffic data and designed standard reporting forms. IBM produced the first automatic vehicle counters.

Fairbank tested the approach in Michigan, where the Highway Department had established 598 traffic counting stations by 1929. Beginning in 1936, BPR

required every state to implement a statewide highway planning survey using Fairbank’s manuals to record comparable data. Congress authorized use of federal-aid funds for the surveys, and by 1938, the surveys were generating detailed views of highway use.

From these data, BPR concluded that toll-based superhighways not only would fail to address pressing traffic needs but would generate insufficient toll revenue to pay off the bonds.

Intellectual Foundation

In 1937, President Franklin D. Roosevelt, a road enthusiast, asked BPR to study the congressional proposals. The report became a landmark document in American highway history. *Toll Roads and Free Roads* refuted the toll financing plan and the routes proposed in the various bills but was more charitable to the concept of a system of high-standard highways. Those roads, however, had to fit the nation’s highway needs—resources were too scarce to waste.

Fairbank’s staff prepared a map for a 26,000-mile system that could be constructed under federal-aid mechanisms, earning the designation of free roads. The highway planning survey data indicated that the most pressing highway needs were in and near cities.

This finding led BPR to urge that more funds be allocated to urban roads. The idea did not appeal to



Photo: AASHTO

Road building—here, with a World War I surplus, chain-driven distributor—was a frequent work-relief project during the Great Depression.

Roosevelt, however, who feared the enormous costs of urban highways. The President directed BPR to alter that section of the report; the introduction was changed, but not the data analysis. *Toll Roads and Free Roads*, released in 1939, provided the intellectual foundation for the Interstate system.

Alternative Models

Individual members of Congress were not alone in circulating alternative models for highway projects during the late 1930s. Backed by loans from the Public Works Administration, officials in Pennsylvania in 1939 began constructing a modern turnpike from Carlisle, near Harrisburg, west to Irwin, near Pittsburgh.

Echoing their usual analysis of toll highways, BPR experts predicted the project would prove a financial failure, but the toll receipts exceeded expectations. Motorists and truckers almost immediately urged extension of the road, demonstrating a willingness to pay a premium for speed and convenience.

Futurama Effect

This response helps explain the popular fascination with another road vision of the time, Norman Bel Geddes' fanciful projection of 1960s roads for General Motors' pavilion at the 1939–1940 World's Fair in New York. Perhaps the fair's most popular exhibit, Futurama showed 12-lane superhighways and 120-miles-per-hour speeds.

BPR and MacDonald disparaged Bel Geddes as an interloper and dismissively contrasted his designs with BPR's more careful engineering approach. Nevertheless, state highway engineers acknowledged that the Futurama inspired public support for a new level of highways.

President Roosevelt shared the public's enthusiasm for Bel Geddes' conception and acted on the excitement generated by the fair and by the release of *Toll Roads and Free Roads*. In 1941, he appointed a National Interregional Highway Committee to explore details more thoroughly.

Interregional Committee

Chaired by MacDonald with Fairbank as committee secretary—and eventually primary author of the report—the committee included Frederic Delano, who had just finished chairing the National Resources Planning Board; city planner Harland Bartholomew; G. Donald Kennedy, highway commissioner of Michigan and president of the American Association of State Highway Officials; California highway engineer C. H. Purcell; former governor of Alabama Bibb Graves; and Rexford Tugwell, a New Deal planner.

The war initially slowed their work, but by 1943 the committee was motivated by fears that the end of the war might bring a return to the Depression. The committee assembled an enormous amount of information from the planning surveys and laid out three road system scenarios varying in length from 34,000 to about 48,400 miles.

Postwar worries also prompted the suggestion to alter the federal-aid matching ratio from 50:50 to 75:25. The committee's 1944 report shaped the Federal-Aid Highway Act of 1944, which added an Interstate Highway System of 40,000 miles to the existing primary, secondary, and rural federal-aid systems. Although the legislation failed to provide funds specifically designated for the new roads, by 1947 BPR engineers and state highway department leaders had released a map of the basic location of rural routes, postponing the designation of 5,200 miles of Interstate roads in and around cities.

Postwar Traffic Boom

With the end of the war, traffic and travel increased, but postwar road construction started slowly, to the chagrin of politicians, motorists, and truckers. Record numbers of vehicle-miles were posted each year from 1946 through 1952, and vehicle registrations jumped from 31 million to 44.7 million between 1945 and 1949. As MacDonald had predicted in 1944, "Everyone in the United States is waiting for the close of the war to get a car to go someplace."

Yet only in isolated spots on the East or West Coasts could states afford to launch an Interstate project. The problem went much deeper than the lack of designated funds for Interstate construction. Congress had increased the size of federal-aid appropriations in 1944 to \$500 million per year, but more money was not the answer for many states.

Many states struggled to provide the required 50:50 match for their additional federal-aid dollars, and the volume of unspent federal-aid allocations reached \$500 million in late 1947—enough to justify suspending the 1949 appropriation. More money for Interstates would not have helped, and in 1949 and 1950, Congress decided that \$450 million per year was all the states could match. The postwar inflation and shortages of some road-building materials during the Korean conflict slowed construction programs.

Under pressure to address the problem, Congress instead debated about road funding. Contentious hearings in 1948, 1950, and 1952 produced no agreement on how to proceed. Proponents of rural and secondary, urban, and interstate networks all argued for more funds. Congress added a pittance—\$25 million—for the Interstate network in 1952, but the general problem of limited state finances persisted.



Although Norman Bel Geddes' Futurama exhibit at the 1939 World's Fair featured dramatic and complicated high-speed highway interchanges, it also projected high-rise developments with urban traffic on multilevel roadways.

Congress was stymied by the magnitude of the problem and by the costs of the answers.

States Take Action

During this stalemate, a handful of states with strong highway departments attempted to attack the problem on their own. California worked on Los Angeles freeways; Robert Moses expanded the Long Island parkways; officials in Chicago and Detroit launched urban expressways.

North Carolina was typical of many states that attempted to improve interstate routes using primary road funds. Several Eastern and Midwestern states emulated Pennsylvania and created toll-financed rural toll roads. Maine acted first, followed in rapid succession by New Hampshire, Maryland, West Virginia, Ohio, Oklahoma, Colorado, New Jersey, New York, Indiana, and Illinois.

By October 1953, 762 route miles of toll highways were open, with another 1,100 miles under construction in 11 states. These roads improved service for long-distance travelers but did not address municipal problems. State planners deliberately routed the high-speed highways around, not into, urban areas.

As BPR had predicted, some roads did not pay for themselves—for example, in West Virginia and Oklahoma. In short, toll roads were not a universal solution for building better highways for the increasing numbers of drivers.

The Administration Responds

The answers had to come from the political arena, and President Eisenhower deserves the credit for starting that process. In his memoirs, Eisenhower reported a sense of urgency for several reasons, including the wave of traffic. The 10 million new vehicles registered between 1952 and 1955 more than equaled the total number of vehicles in Britain and France. At the same time, governors were pressing for changes, such as removing the federal gas tax so that states could gain revenue.

Although the Korean conflict dominated their agenda, Eisenhower's domestic staff started studying the highway problem in late 1953 and early 1954. Treasury Secretary George M. Humphrey, Undersecretary of Commerce for Transportation Robert Murray, and Commerce Secretary Sinclair Weeks were involved, but Arthur Burns, chair of the Council of Economic Advisers, was most influential in shaping these studies.

General John Bragdon was assigned to explore highway plans based on premises different from those of the federal-aid system. The presidential advisers believed that Interstate roads should be con-



SOURCE: PENNSYLVANIA DOT

structed by the federal government, not under federal-aid principles, because the Interstates had national importance and because efficiencies could be achieved.

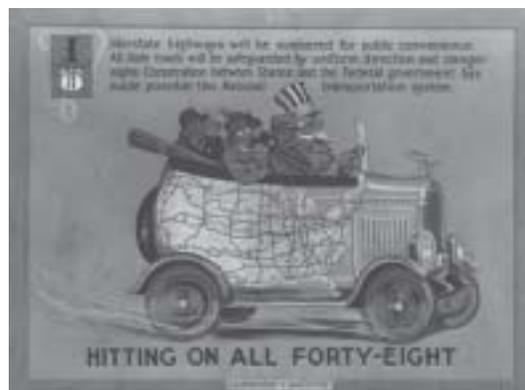
The advisers wanted the roads to be self-liquidating, collecting tolls to repay bonds. Toll receipts from heavily used routes would offset losses elsewhere; such transfers were not possible under the federal-aid principle.

The economists hoped to use highway construction as a counter-cyclical economic tool, subordinating the road program to the state of the economy. They wanted Interstate roads to bypass, not enter, cities. Like Roosevelt, Eisenhower and his aides feared the costs of urban road construction.

Cars line up at the Blue Mountain Interchange at the opening of the Pennsylvania Turnpike, October 1, 1940. Billed as the “road of the future,” the turnpike has been incorporated into Interstates 70 and 76.

New Rationale

In 1954, Congress had increased road appropriations to \$875 million, with \$175 million for Interstate highways, but the structural financial problems remained. In July, Eisenhower arranged to deliver a speech to the governors but was unable to make it because of a death in the family; Vice President Richard Nixon substituted. The speech did not cover all of the administration's discussions but created a stir by proposing to spend \$5 billion a year for 10



SOURCE: AASHTO



Members of the Clay Committee present President Eisenhower with their report and recommendations on financing a national interstate highway network, January 11, 1955: (left to right) Lucius D. Clay, Frank Turner, Steve Bechtel, Sloan Colt, William Roberts, and Dave Beck. Eisenhower points to a page with a map of the proposed system.

years on highways, mostly for Interstate routes between cities.

The speech also alluded to the civil defense implications of these roads, raising an argument with powerful public relations appeal during the early years of the Cold War. This new rationale for urban Interstates had no effect on the roads' design or location, but it added political momentum.

After the well-received speech, Eisenhower appointed an Advisory Committee on a National Highway Program, chaired by former general and wartime colleague Lucius Clay. Other members included San Francisco engineer Stephen Bechtel, Teamsters Union President Dave Beck, Bankers' Trust President Sloan Colt, and Allis Chalmers CEO William Roberts. Francis Turner, a BPR engineer, was named executive secretary, and BPR provided staff support.

Continuing Problems

The committee quickly reviewed options and gathered input from all concerned parties. Most highway officials and road supporters were unwilling to endorse some of the administration's goals. For example, Pyke Johnson, former director of the Automobile Chamber of Commerce and the Automotive Safety Foundation, as well as a close friend and longtime supporter of MacDonald, was part of an advisory group from the highway community that pressed to retain the federal-aid approach. In other words, the committee faced the continuing problem of which roads to build and how to pay for them.

Clay's group produced a report by January 1955 that had as its centerpiece a federally constructed Interstate program that would cost \$25 billion over

10 years, paid for by bonds and tolls. They urged creation of a National Highway Authority to deal with finances, with BPR serving as the technical authority. The federal-aid program was to continue for the so-called ABC system of primary, secondary, and urban roads.

Bragdon bitterly blamed BPR's "horse and buggy" thinking for the committee's failure to endorse all the administration's ideas. But when Eisenhower forwarded the report to Congress in late February, leaders in both parties proved even more resistant to changing the federal-aid highway program as Eisenhower and the Clay Committee proposed.

Several factors were at play, including traditional partisan politics. Democrats, who controlled the Senate, were not eager to give Eisenhower a major victory just before a presidential election year. But Republicans also had issues, including the challenge of reconciling the staggering cost of the program with their philosophical abhorrence of big government.

Legislative Proposals

Amid these concerns, Senator Albert Gore of Tennessee chose not to wait for the Clay bill to emerge from the House, which by precedent first considered highway legislation. Because Senator Harry Byrd of Virginia, powerful chair of the Finance Committee, refused to support a bond financing plan, Gore proposed adding \$10 billion to the federal-aid program for Interstate construction, with an adjusted matching requirement of 75:25. The Senate rejected the Clay plan and then easily passed the Gore bill in May 1955.

On the House side, Representative George Fallon of Maryland also doubted Clay's plan could win support, so he introduced a bill to create the National System of Interstate and Defense Highways, with increased user taxes—especially on gasoline—to be dedicated informally to the project. Fallon also proposed shifting the matching ratio to 90:10. He drew on the assistance of BPR's Turner in drafting the bill, relying on federal agency expertise as House Roads committee chairs had done since the 1910s.

Fallon's bill failed to win a majority, although the Clay bill suffered an even worse defeat. In addition to partisan challenges, the bills received adamant opposition from the oil industry, trucking associations, tire producers, and others who were to pay for the new roads. Although the year had started on a positive note, 1955 ended with the hopes of many road supporters dashed.

Brighter Prospects

Yet as the legislative season dawned for 1956, the prospects for a road bill looked brighter, mainly

because the truckers and the tire and oil industries had reconsidered their stance on new taxes. In addition, BPR had issued its first information on the programming of the urban sections of the Interstate system, releasing the famous “Yellow Book” with its crude route outlines for more than 5,000 miles in metropolitan areas. This added immediacy to the situation and meant that many more Congressional districts could now see the immediate effect of the legislation.

BPR had been working on several technical studies of financing needs, toll roads, and the costs of utility relocation at the requests of Congress and the administration since 1954. This willingness to turn thorny problems over to the highway engineers for resolution reflected the continuing confidence that many elected representatives—especially members of the two road committees—felt toward the technical and nonpartisan experts at BPR. The reports helped remove many of the sticking points that confronted a larger highway program in Congress.

In 1956, the political discussions resumed in the House, because the Senate had approved Gore’s bill. In the House, Fallon reintroduced a revised bill, calling for \$24.8 billion over 13 years for construction of an Interstate system of about 40,000 miles. The federal–state matching ratio for these roads would be 90:10. The bill also included additional funds for all other components of the federal-aid road network.

House Appropriations Committee chair Hale Boggs of Louisiana added a key provision to the funding mechanism by requiring that all new tax revenue go into a Highway Trust Fund. These tax revenues would accumulate in the fund to meet construction expenses. With that assurance, the House passed the bill on April 27.

The Senate debated the new bill, concerned about the cost, but passed its version after Byrd successfully introduced amendments controlling expenditures from the trust fund. A joint House–Senate conference worked until June 25 to reach an agreement. President Eisenhower signed the bill without fanfare in a room at Walter Reed Army Medical Center, where he was being treated for ileitis.

Shaping the Approach

With the end of a decade of rancorous political discourse about road priorities and fiscal policy, the massive road construction program began. BPR engineers had played their traditional role, unobtrusively guiding the development of highway policy by providing the pivotal technical expertise. They had worked with the Congressional leaders of both parties, with the Clay committee, and with the administration, helping

shape an approach to road construction that reflected the agency’s long-held ideals.

Bragdon was not completely wrong in blaming BPR for overturning the new vision crafted by Eisenhower appointees. Through dogged persistence, the engineering-based visions that emerged during the 1930s finally came to fruition.

The consequences of the engineers’ efforts were both positive and detrimental, planned and unintended. The funding and administrative structure they helped put in place in 1956 advanced construction by removing much of the process from politics—especially the contentious question of funding—in the interest of efficiency and speed.

Among the most unexpected results of this action was the emergence of popular resistance to building roads into and through cities, parks, and areas of scenic beauty—in part because the process allowed little public input. This eventually caused engineers in the state and federal highway bureaucracy to lose their position of primacy over highway construction in the United States. After 1956, highway engineers never again would dominate the highway policy scene as they had.



On August 2, 1956, Missouri became the first state to award a contract with the new Interstate construction funding. Of three contracts signed that day, the Missouri State Highway Commission first authorized a contract for work on U.S. Route 66—now Interstate 44—in Laclede County; the other contracts were for work on U.S. 40—now I-70, the Mark Twain Expressway—in St. Louis and for another section of the highway in St. Charles County. Work started August 13.